

CHAPTER 2

DESCRIPTION OF THE MISSISSIPPI RIVER WATERSHED

- 2.1. Background**
- 2.2. Description of the Watershed**
 - 2.2.A. General Location**
 - 2.2.B. Population Density Centers**
- 2.3. General Hydrologic Description**
 - 2.3.A. Hydrology**
 - 2.3.B. Dams**
- 2.4. Land Use**
- 2.5. Ecoregions and Reference Streams**
- 2.6. Natural Resources**
 - 2.6.A. Designated State Natural Areas**
 - 2.6.B. Rare Plants and Animals**
 - 2.6.C. Wetlands**
- 2.7. Cultural Resources**
 - 2.7.A. Public Lands**
- 2.8. Tennessee Rivers Assessment Project**

2.1. BACKGROUND. The Mississippi River, derived from the old Ojibwe word *misi-ziibi* meaning 'great river', is the second-longest river in the United States. The Mississippi River has the third largest drainage basin in the world, exceeded in size only by the watersheds of the Amazon River and the Congo River. It drains 41 percent of the 48 contiguous states. The New Madrid Fault Zone, which lies near the cities of Memphis and St. Louis, was responsible for three large earthquakes in 1811 and 1812 which changed the course of the river, creating Reelfoot Lake in northwest Tennessee.

This Chapter describes the location and characteristics of the Tennessee Portion of the Mississippi River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Tennessee portion of the Mississippi River Watershed is located in West Tennessee and includes parts of Dyer, Lake, Lauderdale, Shelby, and Tipton Counties.

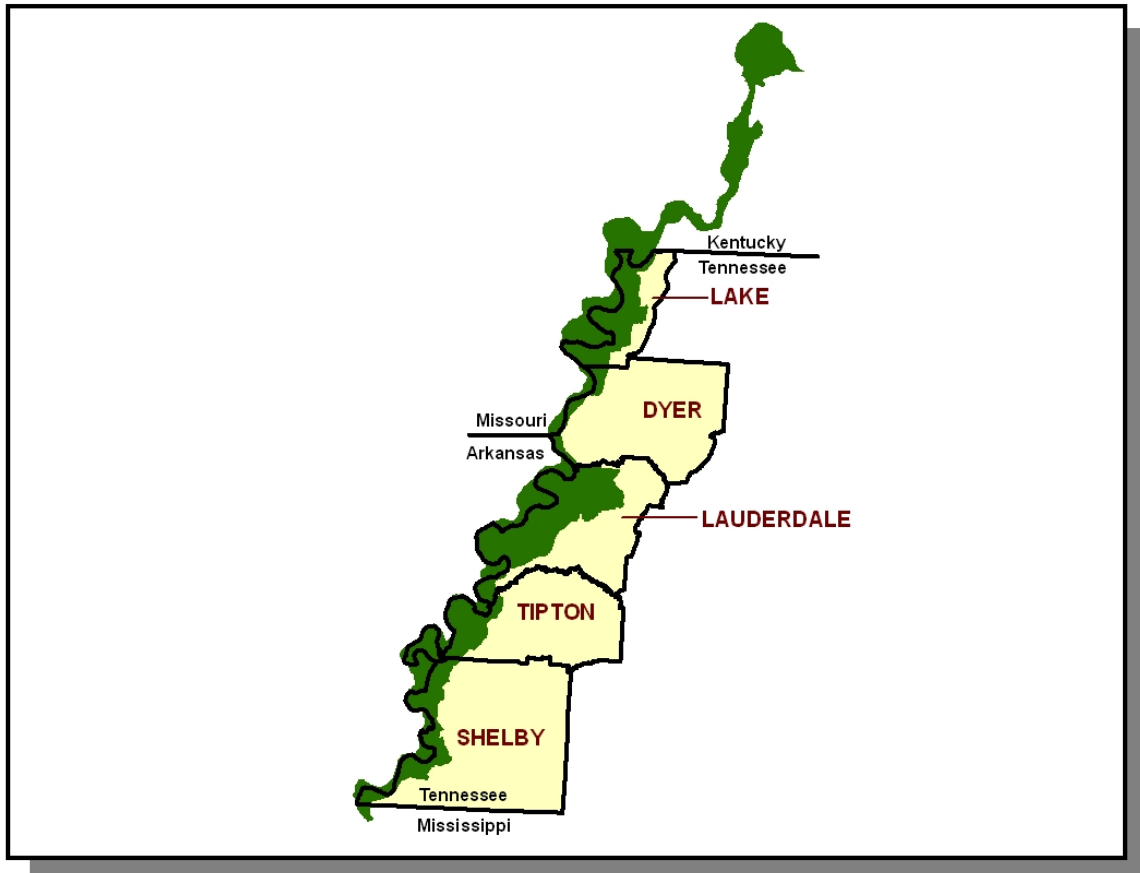


Figure 2-1. General Location of the Mississippi River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Lauderdale	38.27
Shelby	21.41
Lake	18.47
Tipton	10.95
Dyer	6.29

Table 2-1. The Tennessee Portion of the Mississippi River Watershed Includes Parts of Five West Tennessee Counties.

2.2.B. Population Density Centers. Four interstates and eighteen highways serve the major communities in the Tennessee portion of the Mississippi River Watershed.

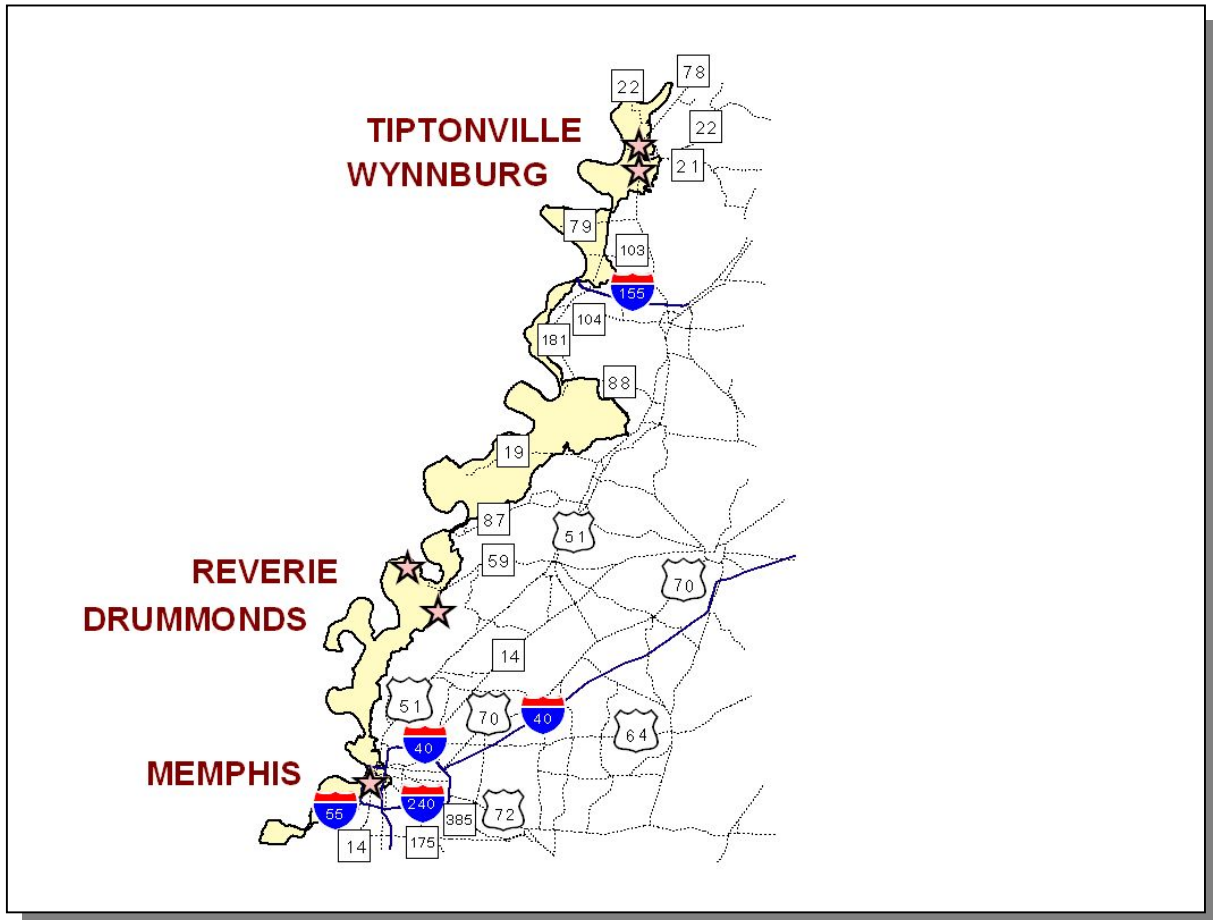


Figure 2-2. Communities and Roads in the Tennessee Portion of the Mississippi River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Memphis*	666,786	Shelby
Tiptonville*	4,765	Lake
Wynnburg	2670	Lake
Drummonds	2,554	Tipton
Reverie	1,058	Tipton

Table 2-2. Municipalities in the Tennessee Portion of the Mississippi River Watershed. Population based on 2000 census (Tennessee Blue Book) or <http://www.hometownlocator.com>. Asterisk (*) indicates county seat.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Mississippi River Watershed, designated 08010100 by the USGS, is approximately 1,086 square miles (590 square miles in Tennessee) and drains to the Mississippi River.

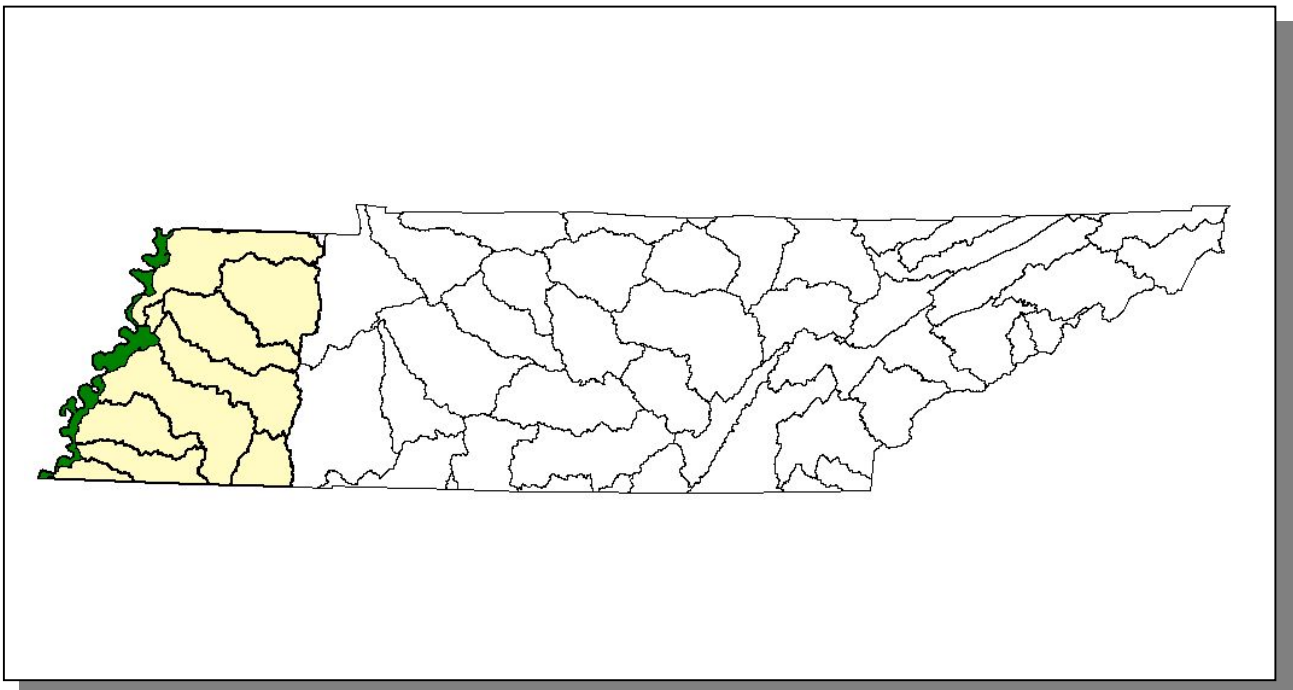


Figure 2-3. The Tennessee Portion of the Mississippi River Watershed is Part of the Mississippi River Basin.

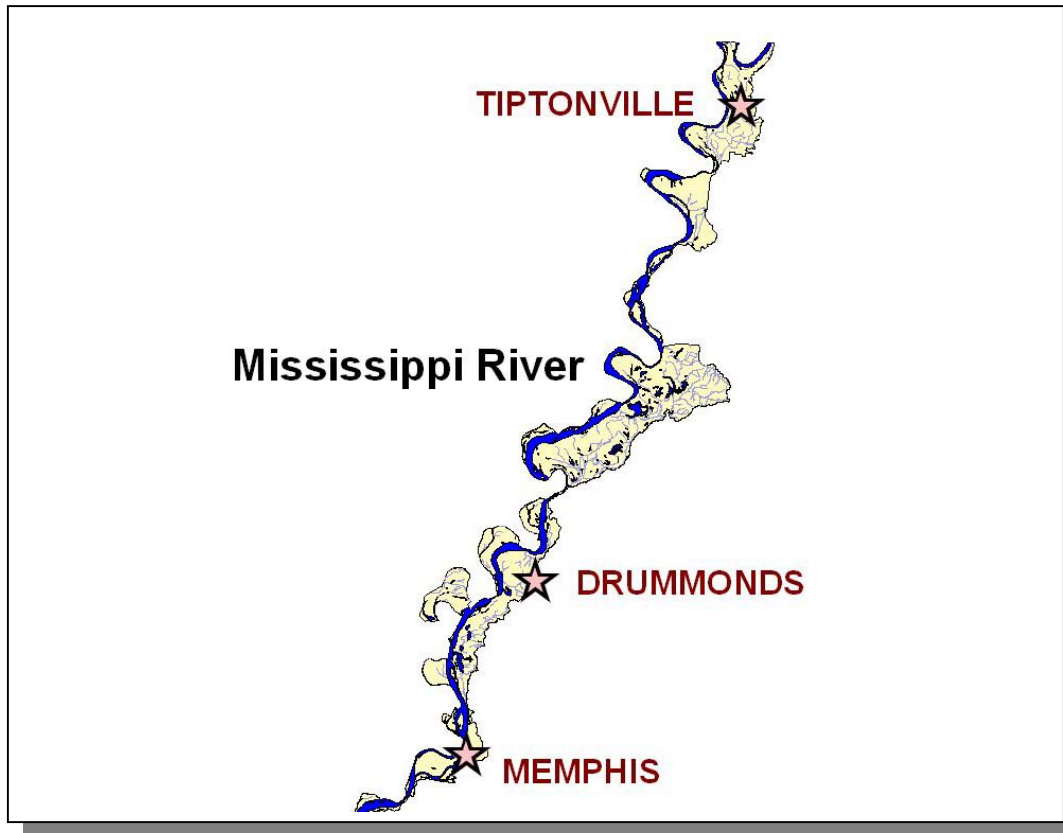


Figure 2-4. Hydrology in the Tennessee Portion of the Mississippi River Watershed. There are 519.9 stream miles and 125 lake acres recorded in River Reach File 3 in the Tennessee Portion of the Mississippi River Watershed. Location of the Mississippi River and the cities of Drummond, Memphis, and Tiptonville are shown for reference.

2.3.B. Dams. There are 9 dams inventoried by TDEC Division of Water Supply in the Tennessee Portion of the Mississippi River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

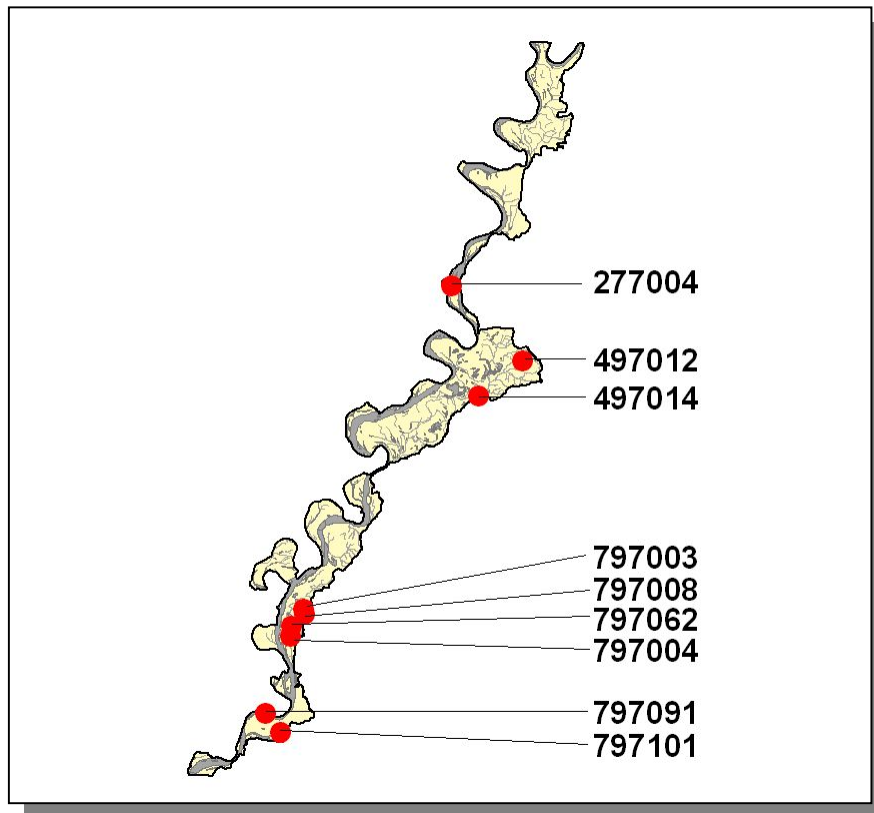


Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Mississippi River Watershed. More information, including identification of inventoried dams labeled, is provided in Appendix II and at <http://gwidc.memphis.edu/website/dams/viewer.htm>.

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.

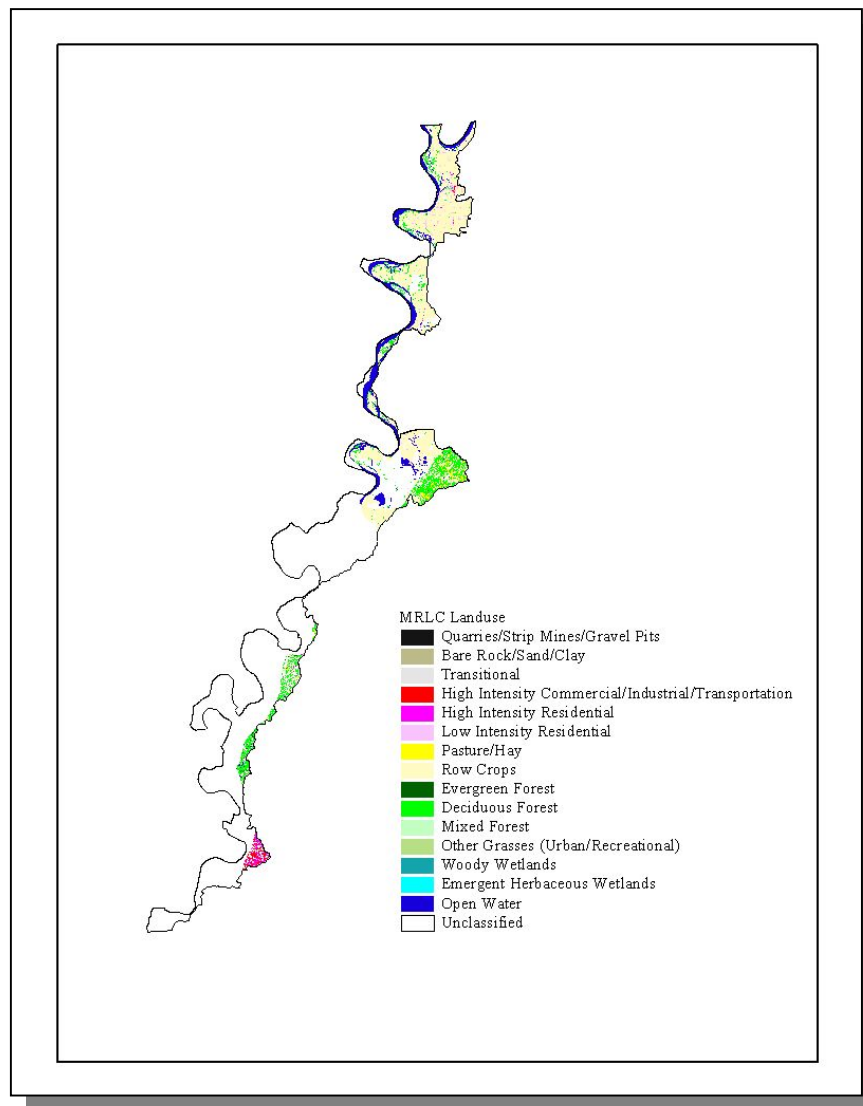


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

DRAFT

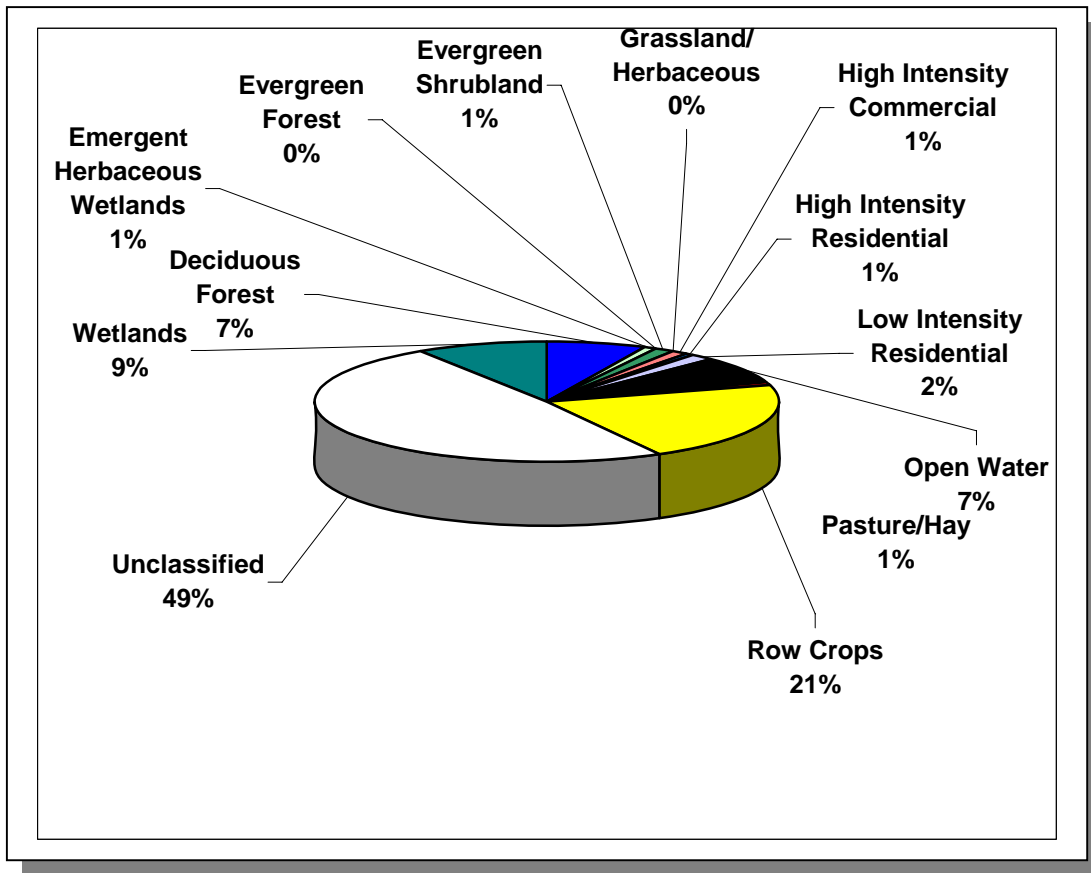


Figure 2-7. Land Use Distribution in the Mississippi River Watershed. More information is provided in Appendix II.

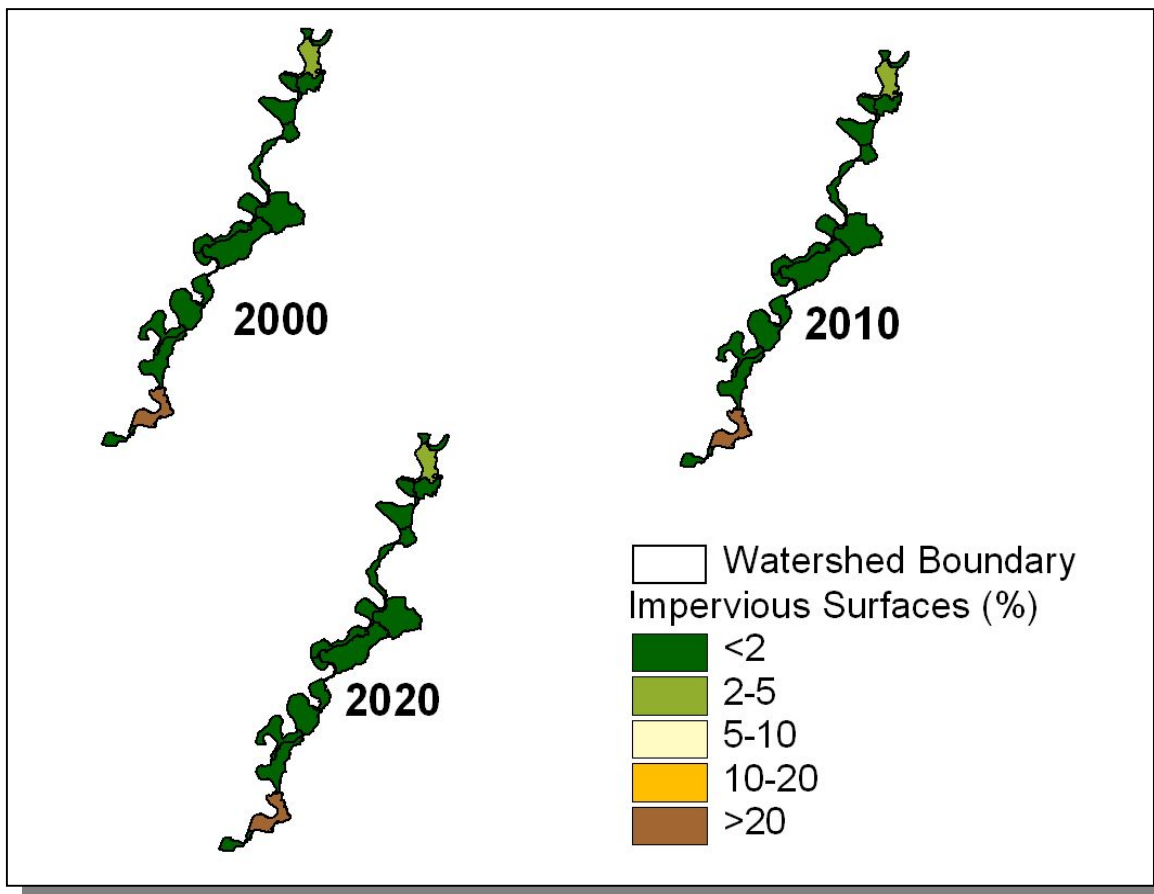


Figure 2-9. Illustration of Total Impervious Area in the Tennessee Portion of the Mississippi River Watershed. All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Mississippi Watershed lies within 2 Level III ecoregions (Mississippi Alluvial Plain, Mississippi Valley Loess Plains) and contains 3 Level IV subecoregions:

- The **Northern Mississippi Alluvial Plain (73a)** within Tennessee is a relatively flat region of Quaternary alluvial deposits of sand, silt, clay, and gravel. It is bounded distinctly on the east by the Bluff Hills (74a), and on the west by the Mississippi River. Average elevations are 200-300 feet with little relief. Most of the region is in cropland, with some areas of deciduous forest. Soybeans, cotton, corn, sorghum, and vegetables are the main crops. The natural vegetation consists of Southern floodplain forest (oak, tupelo, bald cypress). The two main distinctions in the Tennessee portion of the ecoregion are between areas of loamy, silty, and sandy soils with better drainage, and areas of more clayey soils of poor drainage that may contain wooded swamp-land and oxbow lakes. Waterfowl, raptors, and migratory songbirds are relatively abundant in the region.
- The **Bluff Hills (74a)** consist of sand, clay, silt, and lignite, and are capped by loess greater than 60 feet deep. The disjunct region in Tennessee encompasses those thick loess areas that are generally the steepest, most dissected, and forested. The carved loess has a mosaic of microenvironments, including dry slopes and ridges, moist slopes, ravines, bottomland areas, and small cypress swamps. While oak-hickory is the general forest type, some of the undisturbed bluff vegetation is rich in mesophytes, such as beech and sugar maple, with similarities to hardwood forests of eastern Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those of the Loess Plains (74b) to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. Gravels are also exposed in places at the base of the bluffs.
- The **Loess Plains (74b)** are gently rolling, irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick. The region is a productive agricultural area of soybeans, cotton, corn, milo, and sorghum crops, along with livestock and poultry. Soil erosion can be a problem on the steeper, upland Alfisol soils; bottom soils are mostly silty Entisols. Oak-hickory and southern floodplain forests are the natural vegetation types, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats still remain. Several

large river systems with wide floodplains, the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf, cross the region. Streams are low-gradient and murky with silt and sand bottoms, and most have been channelized.

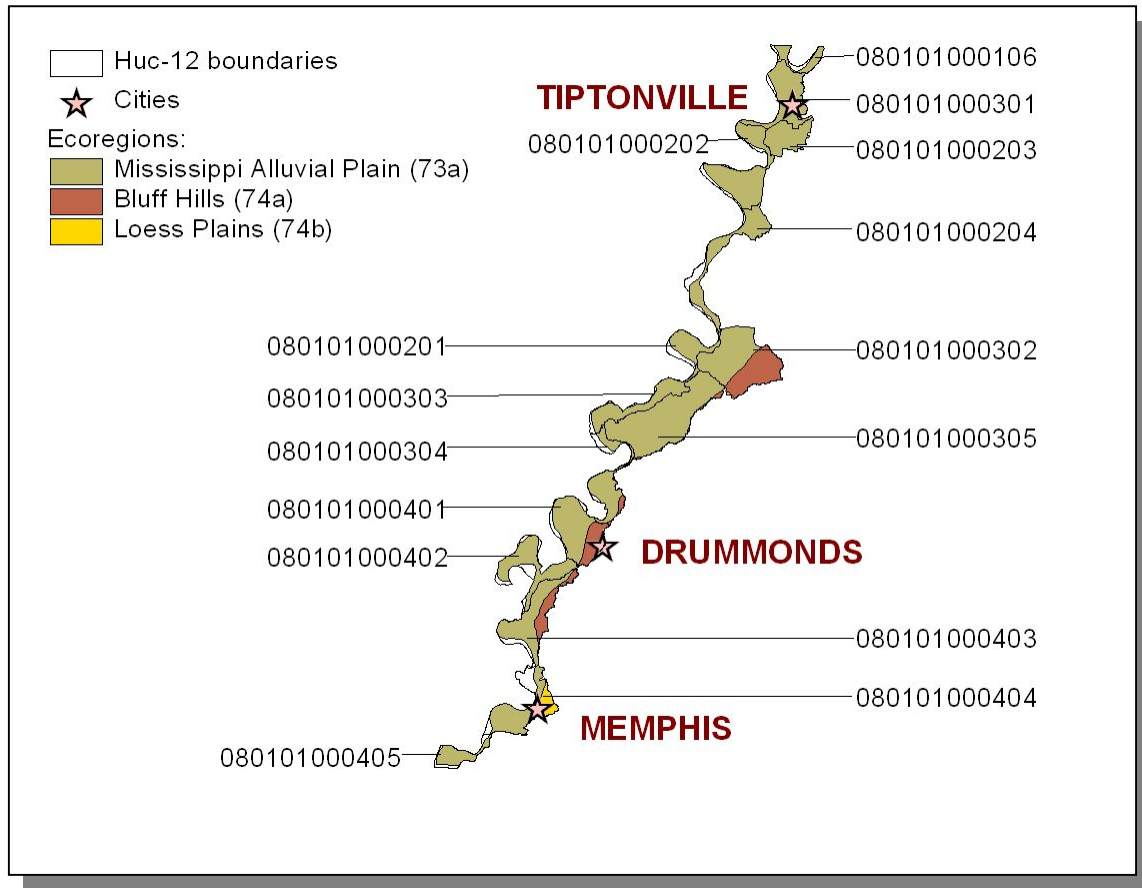


Figure 2-10. Level IV Ecoregions in the Tennessee Portion of the Mississippi River Watershed. HUC-12 subwatershed boundaries and locations of Drummonds, Memphis, and Tiptonville are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

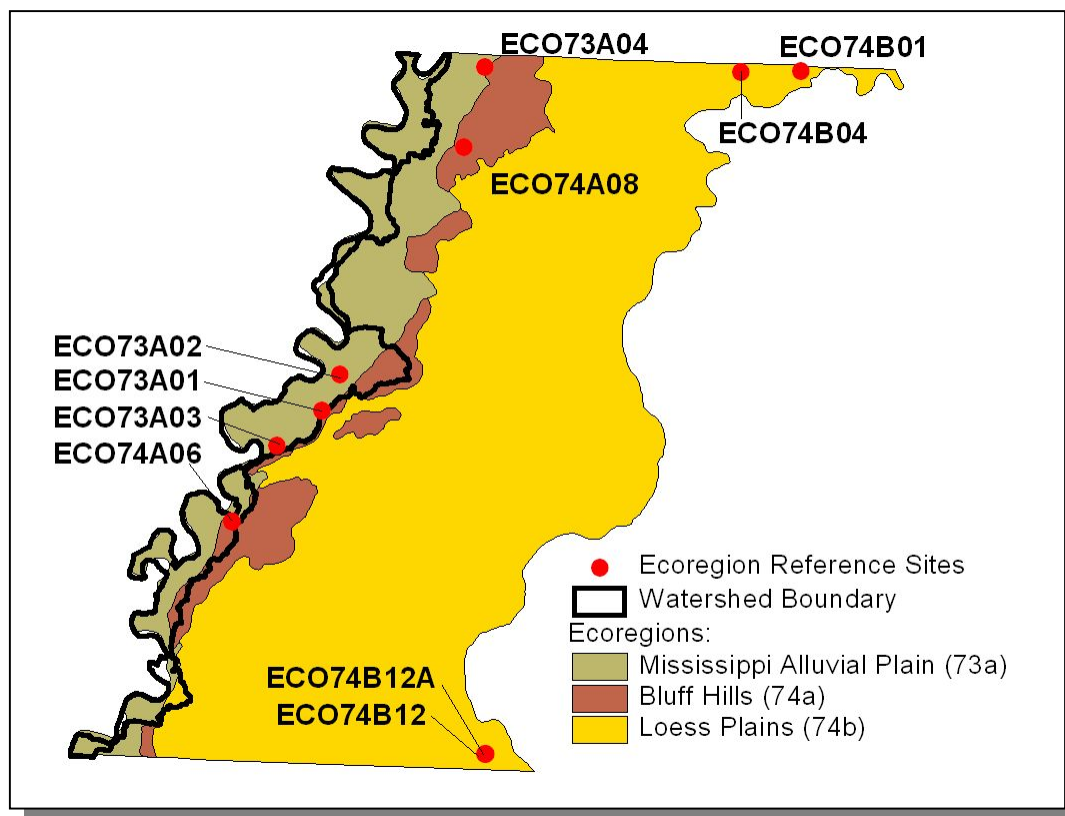


Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 73a, 74a, and 74b. The Tennessee Portion of the Mississippi River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 06/01/2006, is provided in Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Areas administers the State Natural Areas program. Further information may be found at <http://www.state.tn.us/environment/na/>.

The Mississippi River Watershed has two Designated State Natural Areas:

Meeman-Shelby Forest State Natural Area is an 11,000-acre natural area in Shelby County and is located in Meeman-Shelby Forest State Park. Primary management responsibility belongs to Tennessee State Parks. There is also a Wildlife Management Area within the State Park that is managed by the Tennessee Wildlife Resource Agency. Meeman-Shelby Forest State Natural Area is one of the largest contiguous tracts of mature bottomland hardwood forest and Chickasaw Bluff forest left in Tennessee. The natural area includes approximately 7,000 acres of Mississippi Alluvial Plain and approximately 4,000 acres of Chickasaw Bluff.

Sunk Lake is a 1,870 acre natural area located in Lauderdale County about 18.5 miles northwest of Covington. It is located in the Mississippi Alluvial Floodplain and included in the Eastern Gulf Coastal Region of the southeastern United States. Sunk Lake supports excellent examples of bald cypress swamp, bottomland hardwood forest, and open marshy aquatic habitat. The diversity of wetland and upland communities offer a wide range of habitat for waterfowl and other birds, fish, reptiles, amphibians, and both native terrestrial and aquatic vegetation. Rare plant species at Sunk Lake include creeping spot-flower (*Acmella oppositifolia*), featherfoil (*Hottonia inflata*), lake cress (*Neobeckia aquatica*), ovate-leaved arrowhead (*Sagittaria platyphylla*) and cedar elm (*Ulmus crassifolia*).

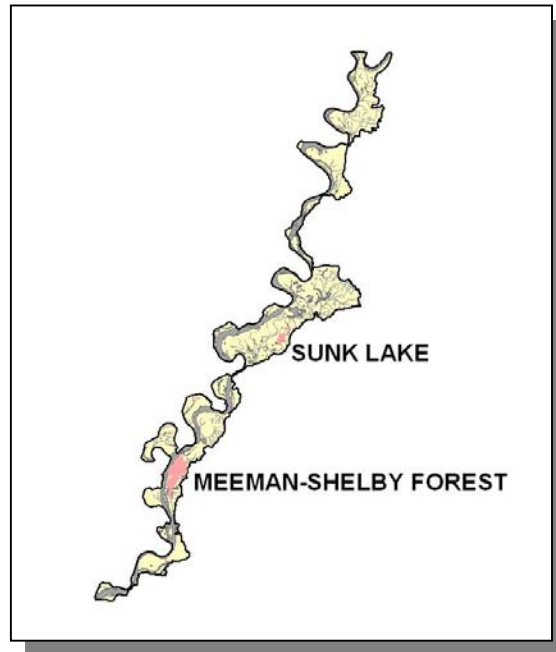


Figure 2-12. There are two Designated State Natural Areas in the Tennessee Portion of the Mississippi River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	0
Insects	0
Mussels	0
Snails	1
Other	0
Amphibians	0
Birds	9
Fish	7
Mammals	1
Reptiles	1
Plants	16
Total	35

Table 2-3. There are 35 Known Rare Plant and Animal Species in the Tennessee Portion of the Mississippi River Watershed.

In the Tennessee Portion of the Mississippi River Watershed, there are seven known rare fish species, one known rare reptile species, and one known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	LE	E
<i>Macrhybopsis gelida</i>	Sturgeon Chub		D
<i>Macrhybopsis meeki</i>	Sicklefin Chub		D
<i>Notropis dorsalis</i>	Bigmouth Shiner		D
<i>Cycleptus elongates</i>	Blue sucker		T
<i>Hybognathus placitus</i>	Plains Minnow		D
<i>Noturus stigmosus</i>	Northern Madtom		D
<i>Macrolemys temminckii</i>	Alligator Snapping Turtle		D
<i>Triodopsis multilineata</i>	Striped Whitelip		

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Mississippi River Watershed. Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: T, Listed Threatened by the Tennessee Wildlife Resources Agency; E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.

2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/na/wetlands/>

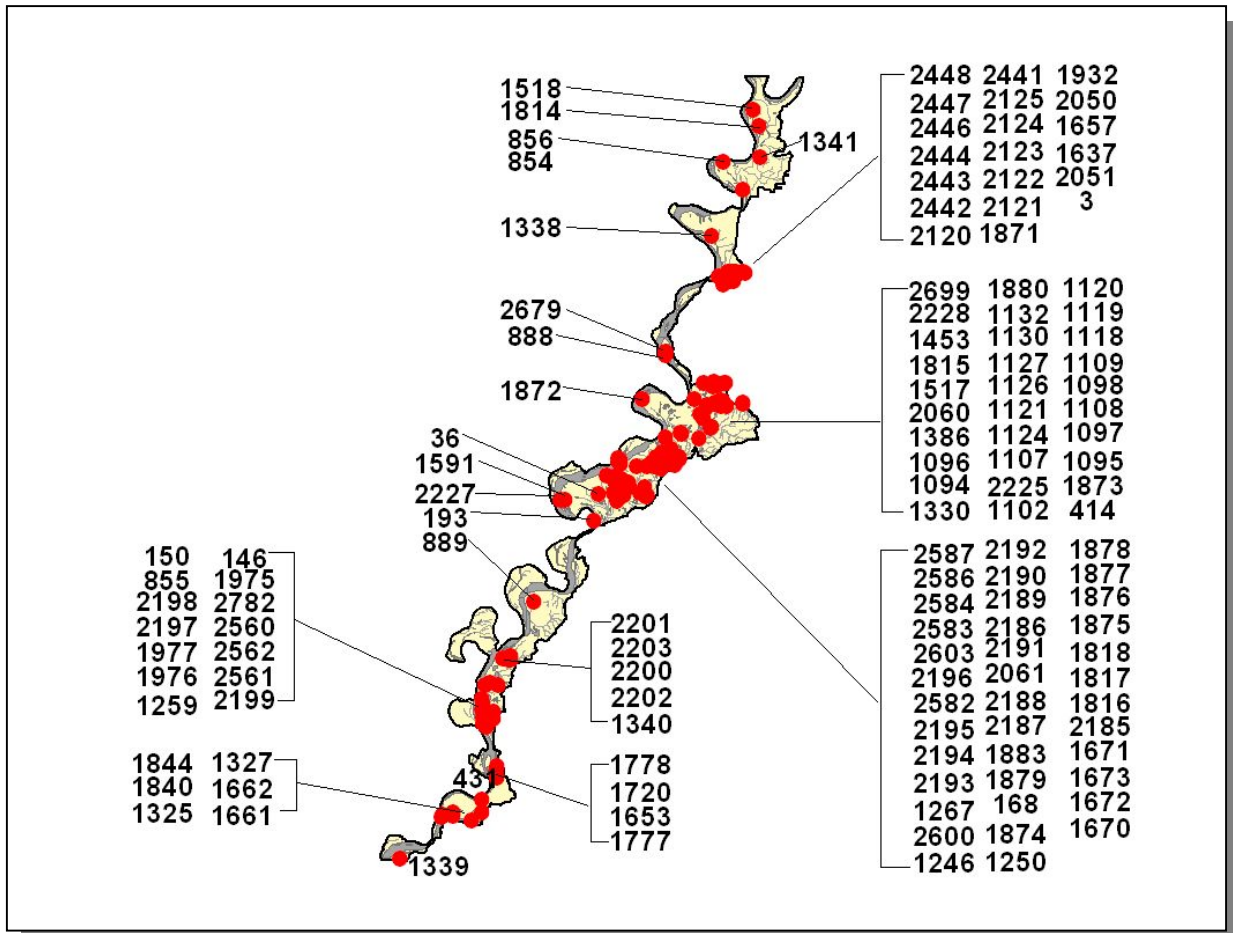


Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Areas Database in Tennessee Portion of the Mississippi River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.

2.7. CULTURAL RESOURCES.

2.7.A. Public Lands. Some sites representative of the cultural heritage are under state or federal protection:

- Chickasaw WMA is a 6,158-acre tract managed by the Tennessee Wildlife Resources Agency (TWRA). More information may be found at <http://www.state.tn.us/twra/gis/wmapdf/Chickasaw.pdf>
- Chickasaw National Wildlife Refuge is a 24,096-acre refuge located in Lauderdale County and managed by US Fish and Wildlife Service. More information may be found at: <http://www.fws.gov/southeast/pubs/facts/rlfpdf.pdf>
- Cold Creek and John Tully WMAs comprise 945 acres and are managed by TWRA. More information may be found at: <http://www.state.tn.us/twra/gis/wmapdf/JohnTully.pdf>
- Eagle Lake WMA is a 1,600-acre refuge managed by TWRA and Ducks Unlimited, Inc. More information may be found at: <http://southern.ducks.org/EagleLakeRefuge.php>
- Ft. Pillow State Historic Area commemorates the Civil war Battle at Fort Pillow. It comprises 1, 734 acres and is managed by Tennessee State Parks. More information may be found at: <http://state.tn.us/environment/parks/FortPillow/>
- John Tully State Forest consists of 2,132-acres of prime forest land managed by the Tennessee Department of Agriculture, Division of Forestry. More information may be found at: <http://www.state.tn.us/agriculture/forestry/stateforests/15.html>
- Lower Hatchie National Wildlife Refuge is a 10,331-acre reserve located in Lauderdale and Tipton Counties and managed by the US Fish and Wildlife Service. More information may be found at: <http://www.fws.gov/lowerhatchie/>
- Mav-Fullen and Upper Mav WMAs are managed by TWRA.
- Meeman-Shelby State Recreation area is a 13,467-acre state forest bordering the Mississippi River and managed by Tennessee State Parks. More information may be found at: <http://state.tn.us/environment/parks/MeemanShelby/>
- Meeman-Shelby State Forest WMA is managed by the TWRA. More information may be found at: <http://www.state.tn.us/twra/gis/wmapdf/MeemanShelbyForestStateParkandSNA.pdf>

- Tumbleweed WMA is managed by TWRA. More information may be found at: <http://www.state.tn.us/twra/gis/wmapdf/Tumbleweed.pdf>
- Presidents Island WMA is managed by TWRA. More information may be found at: <http://www.state.tn.us/twra/gis/wmapdf/PresidentsIs.pdf>
- Sullivan-Chisholm Wetlands WMA is managed by TWRA.
- Whites Lake refuge consists of 615 acres of land managed by TWRA and Ducks Unlimited, Inc. More information may be found at: <http://www.ducks.org/Tennessee/TennesseeProjects/1582/WhiteLakeRefugeWetlandsRestoration.html>

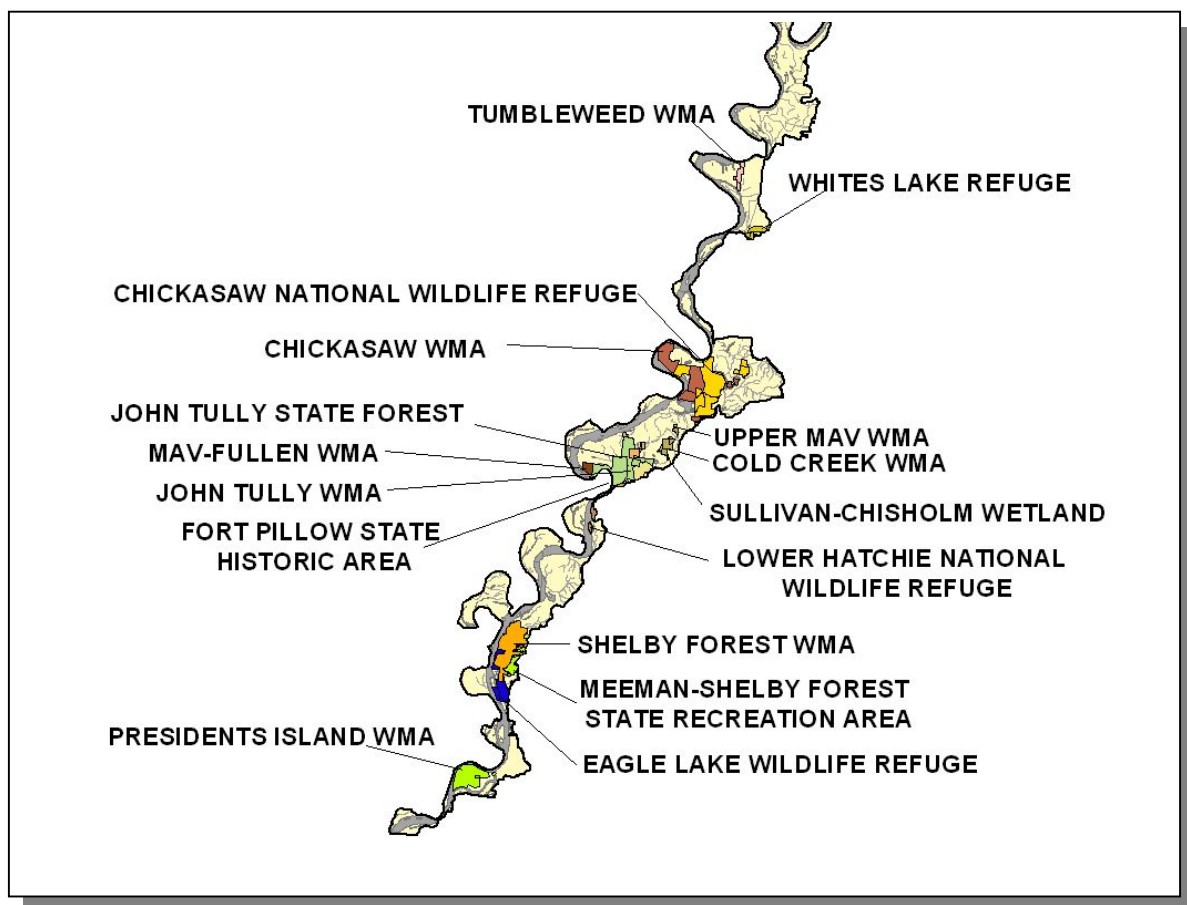


Figure 2-15. Public Lands in the Tennessee Portion of the Mississippi River Watershed.
Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Adams Bayou	2			Knob Creek	3		
Bear Creek	3			Middle Fork Forked Deer River	4		
Blue Bank Bayou	3		3	Mississippi River			
Brinkley Bayou		1		Mooring Bayou	4		
Cold Creek	2	2		Old Bed Forked Deer River	3		
Harbor Channel	3	2,3		Unnamed tributary to North Horn Lake			4
Jones Slough	3		1				

Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the Mississippi River Watershed.

Categories: NSQ, Natural and Scenic Qualities
 RB, Recreational Boating
 RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
 2. Regional Significance; Good Fishery
 3. Local Significance; Fair Fishery
 4. Not a significant Resource; Not Assessed